Claims

1. A method of performing model-based optical proximity correction comprising:
providing a mask matrix having a region of interest (ROI) with a boundary;
locating a plurality of points of interest within said mask matrix;
determining a first single loop finite geometrical shape having a plurality of vertices representative of said located plurality of points of interest; and
collapsing said first single loop finite geometrical shape onto said ROI to correct for optical proximity.

2. The method of claim 1 wherein said step of collapsing said first single loop finite geometrical shape forms a second single loop finite geometrical shape collapsed onto said ROI by pinning at least those vertices of said first single loop finite geometrical shape residing outside the ROI to said boundary of said ROI.

3. The method of claim 2 wherein said first and second single loop finite geometrical shapes have identical finite geometrical shapes.

4. The method of claim 2 wherein said first and second single loop finite geometrical shapes have different finite geometrical shapes.

5. The method of claim 2 wherein said first and second single loop finite geometrical shapes have an identical number of vertices.

6. The method of claim 2 wherein said first and second single loop finite geometrical shapes have a different number of vertices.

7. The method of claim 2 wherein said step of determining said first single loop finite geometrical shape comprises computing said first single loop finite geometrical shape based on a correlation between said plurality of points of interest and said region of interest.

8. The method of claim 2 further including the steps of:

locating a first vertex of said first single loop finite geometrical shape;

locating a second vertex of said first single loop finite geometrical shape; and

determining a location of said first and second vertices within said matrix in relation to said region of interest.

9. The method of claim 8 wherein said first and second vertices are adjacent to each other, and are respectively representative of adjacent first and second points of interest of said plurality of points of interest within said mask matrix.

10. The method of claim 8 wherein said location comprises both said first and second vertices residing within said ROI, the method further including the steps of:

assigning said first vertex to a first vertex of said second single loop finite geometrical shape within said ROI; and

repeating said steps for all vertices of said first single loop finite geometrical shape.

11. The method of claim 8 wherein said location comprises said first vertex residing within said ROI and said second vertex residing outside said ROI, the method further including the steps of:

pinning said second vertex to a closest point of intersection with said boundary of said ROI;

assigning said first vertex to a first vertex of said second single loop finite geometrical shape within said ROI;

assigning said pinned second vertex to a second vertex of said second single loop finite geometrical shape within said ROI; and

repeating said steps for all vertices of said first single loop finite geometrical shape.

12. The method of claim 8 wherein said location comprises said first vertex residing outside said ROI and said second vertex residing within said ROI, the method further including the steps of:

pinning said first vertex to a closest point of intersection with said boundary of said ROI;

assigning said first pinned vertex to a first vertex of said second single loop finite geometrical shape within said ROI; and

repeating said steps for all vertices of said first single loop finite geometrical shape.

13. The method of claim 8 wherein said location comprises both said first and second vertices residing outside said ROI, the method further including the steps of:

determining a region of said mask matrix wherein said location of said first vertex resides;

pinning said first vertex to said boundary of said ROI based upon said region of said mask matrix where said first vertex resides, wherein:

if said first vertex resides within a region adjacent to a corner of said ROI, pinning said first vertex to a closest corner of said ROI,

if said first vertex resides within a region adjacent to a lateral edge of said ROI, pinning said first vertex to a closest lateral edge of said ROI; and

repeating said steps for all vertices of said first single loop finite geometrical shape.

14. The method of claim 13 further including the steps of:

locating a lateral edge of said first single loop finite geometrical shape joining said first and second vertices; and

determining whether said lateral edge intersects said ROI at two pinned points.

15. The method of claim 14 wherein it is determined that said lateral edge intersects said ROI at two points, the method further including the steps of:

assigning a first of said two pinned points to a first vertex of said second single loop finite geometrical shape within said ROI; and

assigning a second of said two pinned points to a second vertex of said second single loop finite geometrical shape within said ROI.

16. The method of claim 14 wherein it is determined that said lateral edge does not intersect said ROI at two points, the method further including determining whether said first and second vertices reside in the same region of said mask matrix.

17. The method of claim 16 further including the steps, wherein;

if said first and second vertices reside in the same region, proceeding to said step of repeating said steps for all vertices of said first single loop finite geometrical shape,

if said first and second vertices do not reside in the same region, determining whether said first and second vertices reside in adjacent regions of said mask matrix.

18. The method of claim 17 further including the steps, wherein;

if said first and second vertices reside in adjacent regions of said mask matrix, proceeding to said step of repeating said steps for all vertices of said first single loop finite geometrical shape,

if said first and second vertices do not reside in adjacent regions of said mask matrix, determining whether said first and second vertices do not reside in adjacent regions of said mask matrix.

19. The method of claim 18 further including the steps, wherein;

if it is determined that said first and second vertices are not, not residing in adjacent regions of said mask matrix, stopping said method due to an error,

if it is determined that said first and second vertices do not reside in adjacent regions of said mask matrix, then said lateral edge joining said first and second vertices resides outside said ROI and the method further includes the step of: